Subject: Joint CNM/MSD Colloquium, Thurs, Aug. 31, 11am, 200 AUDITORIUM
From: Janice Coble <coble@anl.gov>
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ARGONNE NATIONAL LABORATORY
JOINT COLLOQUIUM
CENTER FOR NANOSCALE MATERIALS
and the MATERIALS SCIENCE DIVISION

SPEAKER: Bernd Gotsmann
     IBM Zurich Research Laboratory (Rueschlikon, Switzerland)

TITLE: "Nanotechnology Entering Data Storage; a Prototype Parallel
     Probe Storage System"

DATE: Thursday, August 31, 2006

TIME: 11:00 a.m.

PLACE: Bldg. 200-AUDITORIUM

HOST: Orlando Auciello

ABSTRACT: Ultrahigh storage densities of 1 Tb/in.2 or higher can be achieved by using local-probe techniques to write, read back, and erase data in very thin polymer films. This Atomic Force Microscopy based data storage concept involves making indents in a thin polymer film using heated cantilever/tips. Our thermo-mechanical scanning-probe-based data-storage system, internally dubbed 'millipede', combines high storage density, small form factor, and high data rate.

After illustrating the principles of operation of our concept, some of the technical requirements are related to the underlying issues of materials science. For example, polymer kinetics is discussed under extreme conditions and at different time scales: 10^{-6}s during indentation (writing), 10^8s during relaxation (bit retention). Some aspects of scalability are presented, e.g. storage densities beyond 1 Tb/in2,

Finally, results of the first small-scale prototype storage system with servo navigation and parallel read/write/erase capability using our scanning-probe thermomechanical recording technology are presented. This is the first time a scanning-probe recording technology has reached this level of technical maturity, demonstrating the joint operation of all building blocks of a storage device.

B. Gotsmann, P. Bächtold, G. Binnig, J. Bonan, G. Cherubini, M. Despont, U. Drechsler, U. Duerig, E. Eleftheriou, W. Häberle, C. Hagleitner, D. Jubin, A. Knoll, M. Lantz , A. Pantazi, P. Riel, H. Pozidis, H. Rothuizen, A. Sebastian, R. Stutz, P. Vettiger, M. Varsamou, D. Wiesmann